FHR Currents...

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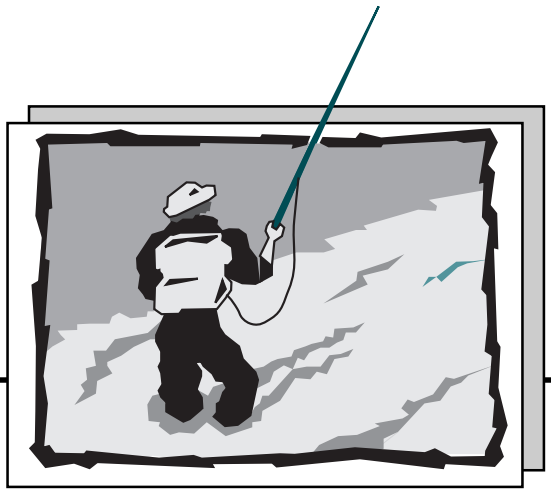

Fishing Economics on the Tule River Ranger District

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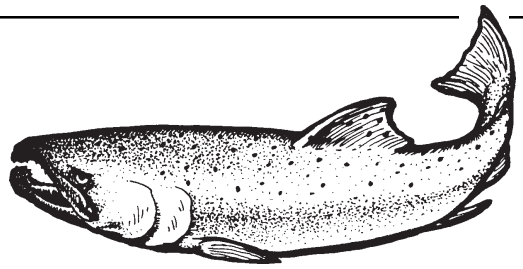
Introduction

People don't usually think about economics and fishing in the same thought. Fishing is fun and relaxation. Economics implies jobs and work. However, it can cost money to have fun and relax on a fishing trip and this money may be spent in small mountain communities. The purpose of this paper is to describe the economic benefits of sport fishing on the Tule River Ranger District, Sequoia National Forest.

Several studies have addressed fishing economics on a national level (USFWS 1993, SFI 1988) and on a local level (Sorg and Loomis 1986, Weithman and Hass 1982, and Brown 1976). However, there is little information available on the economics of sport fishing specific to the southern Sierra Nevada mountains.

The Forest Service and Mountain Home State Forest (MHSF) estimate that about 55,000 people fish in the area of the Tule River District each year (FS Recreation Use Information 1989, MHSF, 1989). These people spend money on gas, food, lodging, tackle, and a variety of other locally provided goods and services. There are both direct and indirect benefits of the money generated from sportfishing. The direct benefit is money spent on tackle, bait, rods, and reels. The indirect benefit is money spent on purchases

FHR Currents...Purpose



The Fish Habitat Relationships (FHR) Program of Region 5, Pacific Southwest Region, USFS has been established to research and develop information on fish ecology and to coordinate effective applications of this knowledge in managing and protecting our fisheries. By relating life state requirements of specific species to physical habitat parameters, we are aiming at our main objective: developing a methodology to manage fisheries through the management of habitat.

The next issue of *FHR Currents* marks the evolution from the Region 5 FHR Technical Bulletin to the National FHR Technical Bulletin. We will now be disseminating information from professionals throughout the country.

Submissions:

The submission process will be the same for the National publication as it has in the past. If you wish to submit a paper, please write Jerry Boberg, Dave Fuller (Technical Editors) or Stephanie Gomes (Editor/Designer) for information and guidelines at: Six Rivers National Forest, 1330 Bayshore Way, Eureka, CA 95501; or call (707) 442-1721.

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of goods and services (gas, food, lodging, and miscellaneous expenses) from local businesses. These represent potential economic stimuli for local communities.

During 1989 and 1990 the Sequoia National Forest, as part of a cooperative effort, had three separate surveys conducted to assess the economic benefits of sportfishing. The method of data collection varied by project but the same economic questions were asked in each survey. This report will summarize the survey results and discuss the potential economic benefit to local communities.

Study Area

The Tule River Ranger District lies south of Sequoia National Park and east of the town of Porterville, California (Figure 1). The district is within a two hour drive from about one million people in the Fresno, Bakersfield and Visalia metropolitan areas. A variety of fishing opportunities exist on the 230,000-acre district which includes about 250 miles of streams and 60 acres of lakes. The Golden Trout Wilderness accounts for about 100 miles of these streams and all of the lake acreage. The streams in the eastern portion of the district are in the Kern River watershed. The western streams are in the Tule River watershed.

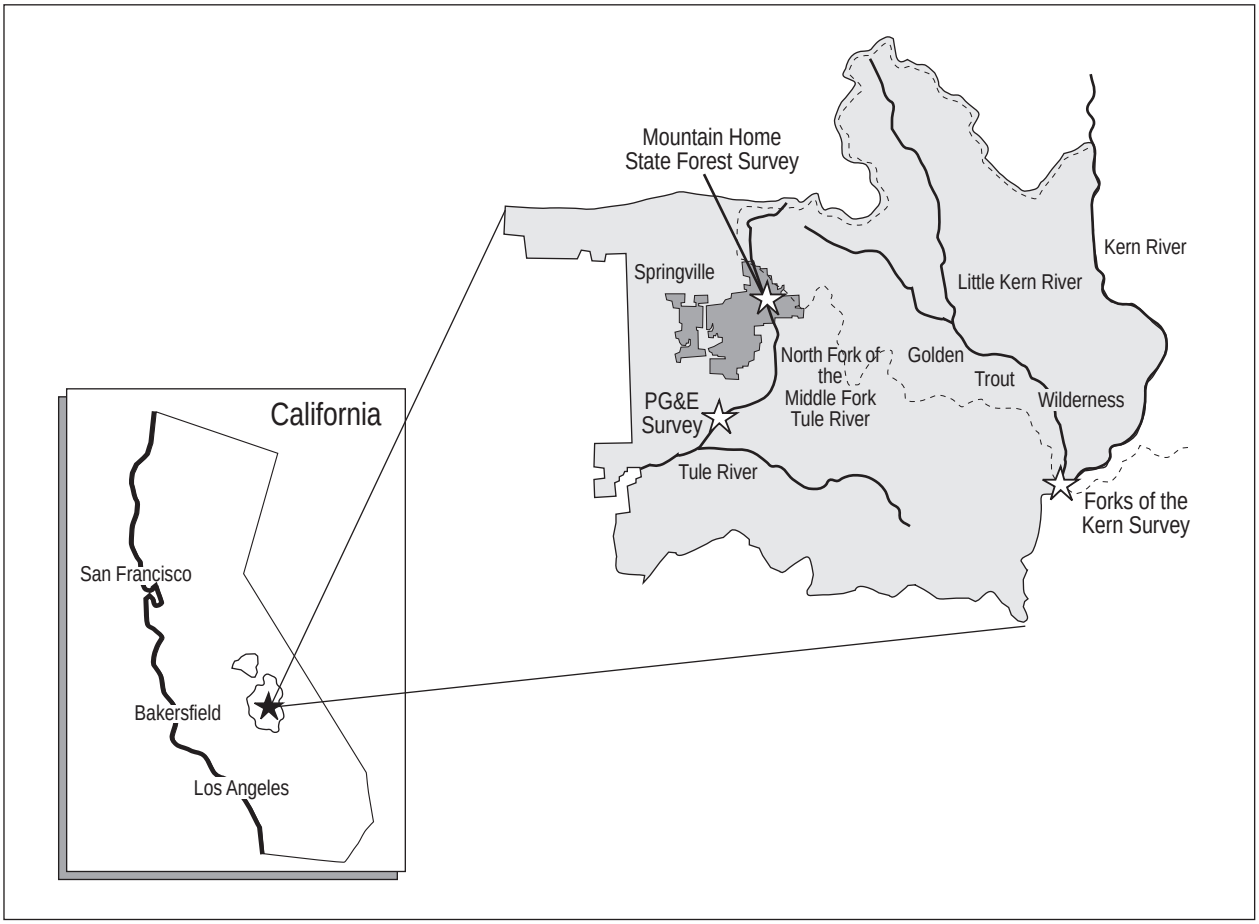

Figure 1. Tule River Ranger District, Sequoia National Forest, California. Location of three creel surveys conducted during 1989 and 1990.

The data for this report were gathered from three locations on or adjacent to the Tule River Ranger District, Sequoia National Forest. Only about five percent of the potential fishable water was covered by the surveys. The first survey area was on the North Fork Middle Fork of the Tule River (NFMF, Figure 1). The survey encompassed the area above and below a hydropower project operated by Pacific Gas and Electric (PG&E). A challenge-cost share agreement between PG&E, the California Department of Fish & Game (CDF&G), and the Sequoia National Forest was designed to collect information on this section of the river. The area is fairly well developed with paved roads and a developed housing community. The Doyle Springs community has about 50 houses and there is also a FS-developed campground along the river. This area is stocked with rainbow trout by the California Department of Fish & Game.

The second survey site was also located on the NFMF Tule River. This section of the river is located north and east of the town of Springville, California, on the MHSF (Figure 1). MHSF conducted an angler survey as part of a challenge-cost share agreement with the Sequoia National Forest. People fishing this stretch of the river use both state and federal land, as the river flows from National Forest through the State Forest and back on to National Forest land. The Mountain Home area is remote with two campgrounds located along the river. The campgrounds are considered primitive with running water but no electricity.

The third survey area was on the Kern River. The CDF&G, in cooperation with the Sequoia National Forest, surveyed anglers using the Kern River near its confluence with the Little Kern River (Figure 1). The Forks of the Kern area receives high visitor use because it provides access to the Golden Trout Wilderness. The area is accessible from the Forks of the Kern trailhead on the Lloyd Meadow road (22S82) and is about a two-mile hike from the trailhead to the river.

Methods

The PG&E survey (Appendix A) was a roving creel survey; anglers were interviewed as they fished. Random days from April through September 1989 were surveyed on the lower portion of the NFMF Tule River. A total of 62 days were spent surveying, 31 days during the week and 31 days on weekends and holidays. About 20 percent of the days per month in each stratum (weekdays and weekends/holidays) were sampled. This survey was based on a stratified random sampling design to better indicate different levels of fishing pressure occuring between weekdays and weekends.

The MHSF survey (Appendix B) was conducted during 1989 (May - October), as a voluntary access-point survey. Employees of MHSF built and erected survey boxes for dispensing and collecting the survey forms. Three boxes were placed within the boundaries of MHSF at places where the river was commonly accessed by anglers. The boxes were stocked with angler survey forms and were checked periodically by employees of MHSF while on their daily rounds to check the campgrounds.

The Kern River survey (Appendix C) was a voluntary access point survey similar to the MHSF survey. The CDF&G is currently using this type of survey statewide as part of the wild trout program. A survey box was erected at the Forks of the Kern trailhead and was in operation during 1990 from the end of May until the end of fishing season.

Visitor use levels for the lower NFMF Tule River (PG&E) and the Kern River (CDF&G) surveys were estimated using the FS Recreation Use Information system. This system is the official medium for reporting recreation use of National Forest System lands and waters. Use levels under the system are reported as recreational visitor days. Visitor days are separated on the basis of activities. A recreational visitor day is based on 12 hours of participating in a given activity. One recreational visitor day may be equal to one person doing a specific activity for twelve hours or twelve people doing the same activity for one hour. For the purpose of this report one recreational visitor day was assumed to be equal to one person fishing for one day. Therefore, the use estimates are probably conservative.

The forms for all three surveys included questions about the amount of money spent on the fishing trip. The economic question was divided into the amount of money spent for the fishing trip on various items (gas, food, bait/tackle, lodging, and miscellaneous expenses). The total expense for the fishing trip was estimated from all of these expenses (Malvestuto, 1983).

Results

In the PG&E angler survey on the NFMF Tule River, a total of 130 people responded to the economic questions. The average dollar amount spent per person was $52 (Table 1). The estimated dollars generated by the recre-

Fishing Expenses (per person, per day in dollars) (95% confidence intervals)						
Survey, River	Gas	Food	Lodging	Tackle	Misc.	***Total***
PG&E, North Fork Middle Fork Tule River	13 (10.4-16.4)	21 (15.0-27.3)	5 (2.8-7.6)	4 (2.4-5.1)	9 (5.0-14.1)	***52 (40.6-65.5)***
Mountain Home State Forest, North Fork Middle Fork Tule River	10 (6.9-13.5)	17 (12.5-20.6)	5 (-0.5-11.4)	2 (1.3-5.3)	5 (1.6-7.9)	***39 (28.0-50.6)***
California Fish & Game, Forks of the Kern	25 (18.6-32.1)	30 (22.4-37.1)	2 (-0.7-4.8)	11 (8.2-14.8)	3 (-1.9-7.6)	***71 (55.6-87.3)***

Table 1. Detailed angler expenses from three surveys on the Tule River Ranger District during 1989 and 1990.

Survey, River	Expenses (per person)	Fishing Days	Total Spent on Fishing
PG&E, North Fork Middle Fork Tule River	$52.00 (40.6-65.5)	16,92	$879,840 (686,952-1,108260)
Mountain Home State Forest, North Fork Middle Fork Tule River	$39.00 (28.0-50.6)	17,14	$668,538 (479,879-867,385)
California Fish & Game, Forks of the Kern	$71.00 (55.6-87.3)	20,680	$1,468,280 (1,149,808-1,805,364)
Total		***54,745***	***$3,016,658 (2,316,639-3,781,009)***

Table 2. Estimated annual dollar expenditures for visitor fishing on the Tule River Ranger District.

ational fishery in the Tule River watershed came to $879,840 (Table 2). About 74% of the people fishing came from the local area, 18% came from southern California, and 8% came from northern California.

In the MHSF survey, 48 economic responses representing 189 people were received. The average dollar spent amount per person was $39. Estimated visitor use levels were 17,142 fishing visitors (Mountain Home State Forest, 1989). This number was used to estimate the value of the fishery. The estimated dollars generated by the recreational fishery at MHSF came to $668,538 (Table 2). About 55% of the people responding to the survey were from the local area, about 39% were from southern California, and 6% came from northern California or another state.

A total of 39 surveys were answered in the Forks of the Kern survey. The average dollar amount spent per person came to a total of $71 (Table 1). The estimated total dollars generated by the recreational fishery came to $1,468,280 (Table 2). No information was gathered on county of origin.

The Tule River Ranger District estimates that 37,600 recreational visitor days were spent during 1989. Of these visitors, it was estimated that 55% of the anglers (20,680) fish the Kern drainage and 45% (16,920) fish the Tule River drainage. These estimates are a rough approximation, but are the best data available on the total use. The total dollars spent on fishing for the entire Tule River district were estimated based on these figures (Table 2).

Discussion

The Tule River Ranger District offers a variety of fishing experiences for all types of anglers. The Sequoia National Forest Land Management Plan (1988) classifies people fishing into three basic angler types. The "fish harvester" type of angler is seeking a high catch rate. Fish stocked in areas not more than one-fourth of a mile upstream or downstream from easy access are sought by this type of angler. Ease of access is most important to these people and they are not disturbed by crowding and heavily used fishing areas. These type of anglers frequent the area surveyed by PG&E. The "fishing explorers" are more likely to hike more than one-fourth of a mile and seek wild fish in a more aesthetic setting. A rustic environment, away from crowds is the type of experience these people are seeking. The Mountain State Forest anglers generally fall into this category. The "wilderness angler" seeks even more seclusion. Fish harvest may not be the main purpose of their trip but is considered important. These people are generally out for more than a day and are usually well prepared for their trip. The CDF&G survey at the Forks of the Kern found this type of angler.

Due to the high variability of the data, we did not try to compare the surveys to each other. We performed limited statistical analysis of this data because of the type of information collected. The survey techniques were not uniform. The PG&E survey directly contacted people while the other two surveys took a passive approach to gathering information. Therefore, the results were not comparable among the surveys.

Lodging costs were low for all areas because the district does not provide a lot of opportunity for motel accommodations. In addition, most forest users are either day-use visitors or campers. Gas costs were logically indicative of the distance people were willing to travel for the type of recreational experience each area affords. Bait and tackle expenses also seemed to fit the type of fishing experience for each area. The "fish harvesters" (lower NFMF Tule River) represent people who were fishing for the day and probably needed to buy bait and tackle on the way to their destination. The "fish explorers" (upper NFMF Tule River) represented more skilled anglers who didn't need to buy a large amount of bait to ensure their success. Overall, the dollar amount anglers spent on fishing was a good representation of the expenses for the type of fishing available on the district.

The expanded dollar figures for the entire Tule River Ranger District have a low degree of accuracy. The recreation use information data are a very rough estimate of visitor use. However, it is the best available information for expanding the survey results to cover the entire district. While the $2,620,970 dollar figure is a rough estimate, it should approximate the order of magnitude of expenditures for fishing that are generated by the resource.

The money generated from fishing represents a small portion of the true value of a fishery. A productive fishery is indicative of clean water and a healthy watershed. These characteristics also provide opportunities for aesthetic and non-consumptive uses.

Small mountain communities can benefit from money spent on fishing trips, but not all of the money generated is spent in these communities. However, money is spent in restaurants, grocery stores, convenience stores and tackle shops in small towns. This helps to support small town economies in a time when other revenue sources are drying up. Also, it is important to understand that these surveys only begin to describe the total benefit of

fishing. Other methods and more extensive surveys should be conducted to show the true benefits to the economy.

The Forest Service is currently shifting management emphasis away from traditional commodity outputs toward fish, wildlife and recreation management. With the economic loss from declining timber outputs, the monies generated from recreation will prove more important to the continued survival of small rural communities. The Forest Service recreation and fisheries staffs need to work together to provide areas that will provide for a variety of recreational fishing experiences. Our emphasis in this area should focus on the users of our resources. Basic land stewardship, including resource protection, enhancement and utilization should be the cornerstone for recreational fisheries management.

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Appendix A.

E N T R I X

873032-200
Interviewer _____

Response of Fish Populations to Altered Flows
North Fork Middle Fork Tule River

creel census questionnaire

Date (yymmdd) ☐ 1-WE ☐ 2-WD	Time (24hr)	Fishing location: Segment no.	Site no. ☐ u/s ☐ d/s	Fishing gear type: (check one)

A.

1. When did you begin fishing here today? Time (24hr) _____ Total hours _____

2. Have you finished for the day? ☐ 1-yes ☐ 2-no

3. How many fish have you caught and kept? HR WR TR BT TO __ __ __ __ __ released? HR WR TR BT TO __ __ __ __ __

4. May I measure them?
   - Hatchery Rainbow
   - Wild Rainbow
   - Brown Trout

5. Have you fished elsewhere today? segment _____ site _____ hours _____

6. If so, how many fish did you catch and keep? HR WR TR BT TO __ __ __ __ __ release? HR WR TR BT TO __ __ __ __ __

7. How many days have you fished on this trip? total hours:

8. How many fish have you caught during this trip?

B.

1. In the past year, how many days have you fished here? April/Sept. _____ Oct./March _____

2. How many fish did you catch per day? April/Sept. _____ Oct./March _____

3. Do you usually fish weekends? always ☐ 1 often ☐ 2 sometimes ☐ 3 never ☐ 4
   Do you usually fish weekdays? always ☐ 1 often ☐ 2 sometimes ☐ 3 never ☐ 4

C.

1. What do you estimate that you will spend on the following items for this fishing trip?

Gas _____ Food _____ Bait _____ Lodging _____ Misc. _____

2. From where did you drive to get here? town _____ zip code _____ total miles _____

Fisherman's name: Phone number:

Comments:

Appendix B.

Angler Survey

The Mountain Home State Demonstration Forest has developed this questionnaire to assess the quality and quantity of fishing. In addition, we are trying to provide you with a diversity of opportunities to enjoy a pleasant outdoor experience. Your opinions will serve to guide us in improving our fisheries and to provide you with a pleasant trip. We hope you have enjoyed your time here and look forward to serving you again! Thank you.

Date:	City/county of residence:	State:	Your present location

Reasons for visit: Camping _____ Hiking _____ Fishing _____ Backpacking _____
Horseback riding: _____ Birdwatching _____ Off Road Vehicle Use _____ Other _____

How long is your trip?	Accommodations for your trip? Campground _____
_____ Days	Day Use _____ Wilderness camping _____

What do you estimate you will spend on this trip for the following items?
Gas $ _____ Food $_____ Lodging $_____ Tackle $_____ Other $_____

How many people in your party?	How many of them fish?

How much time was/will be spent fishing today?	What type gear did/do you use? Lure _____ Fly _____ Bait _____

Where have/will you fish?
Mt. Home/Balch Park Ponds _____ Wishon Fork Tule River _____
Tributary to Wishon Fork _____ Other _____

How many fish did you catch/keep?	How did/will you gain access to your fishing site?
Caught _____ Kept _____	Road _____ Trail _____ Cross Country _____

On a scale of 1-10 how would you rate your fishing experience? (Circle one).
Poor 1 2 3 4 5 6 7 8 9 10 Outstanding

How may we improve your fishing experience?

Please return this questionnaire to any forest employee, drop it off at the forest headquarters or put it in the drop box.

Appendix C.

Kern River Angler Survey

The Department of Fish and Game is conducting an evaluation of the wild trout fishery of the Kern River upstream of the Johnsondale Bridge. New fishing regulations for a four-mile section of the river above the bridge include a two-trout limit with a 14-inch minimum size and artificial lures with barbless hooks. We request your help in this evaluation by providing the following information in this survey. Please use the form for one day's fishing on the Kern River upstream of the Johnsondale Bridge by one angler only. Please do not include information for any fishing you may have done downstream of the bridge.

Date fished _____ Number of hours fished _____

Check one gear used primarily: lure _____ fly _____

Number of rainbow trout caught _____ kept _____ released _____

Number of brown trout caught _____ kept _____ released _____

Section fished:

Check if you fished primarily in the section from the bridge to one-half mile upstream _____

Check if you fished primarily in the section one-half mile to four miles upstream of the bridge _____

Size of fish: (enter number of each species caught by sizes)

	Rainbow Trout		Brown Trout	
	Kept	Released	Kept	Released
Less than 6"		_____		_____
6" - 7.9"		_____		_____
8" - 9.9"		_____		_____
10" - 11.9"		_____		_____
12" - 13.9"		_____		_____
14" - 15.9"	_____	_____	_____	_____
Greater than 16"	_____	_____	_____	_____

Please indicate your satisfaction with the following statements regarding this fishery by circling the number which most closely reflects your feelings.

1. Overall angling experience this day -2 -1 0 +1 +2
2. Size of trout -2 -1 0 +1 +2
3. Number of trout -2 -1 0 +1 +2

What do you estimate you will spend on this trip for the following items?

gas $ _____ food $ _____ lodging $ _____ tackle $ _____

other (specify) $_____

If you wish to provide additional comments, please use the reverse side of this form. Thank you for your cooperation!

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